Synopsis

Ph.D in Special Education

STRUCTURED MODULAR INTERVENTION FOR ENHANCING UNIVERSAL DESIGN FOR LEARNING SKILLS AMONG SPECIAL EDUCATIONAL NEEDS TEACHERS IN INCLUSIVE EDUCATION

By

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Introduction

Universal Design for Learning is an educational setup to meet the challenges in the learning environment which deals with curriculum and to break the barriers faced by student community, *Rose and Meyer* (2008). Universal Design for Learning is to address the inability of schools not the disability of students. Universal Design for Learning pacts with neurological research work, found that the learning process are concerned with brain activities and structure. *Meyer, Rose and Gordon* (2014). This gives the place for the rise of three fundamental principles which are called as principles of Universal Design for Learning; multiple means of engagement, representation and expression

The 21st century also referred to as the technology era, as seen developed and developing countries growing enormously in science and technology. This technological growth helped many developing countries to acquire the status of developed countries. Thus, technology has become a centre point of National Development, especially in education. During the COVID-19 pandemic, this technology made remarkable history in education and higher education. Online classes, online examinations and online degrees become major part of our educational system. New Educational Policy (NEP) 2020 emphasized the same; it assures technology upliftment in education. Universal Design for Learning (UDL) mainly integrates technology, helps the teachers to preserve their class materials and share them with students. UDL principles multiple means of Representation, Engagement and Expression should be applied in the process of teaching and learning by the teachers especially Special Educational Needs Teachers in all the activities to achieve their educational goals. This, helps the teachers to attend all the learners in their classroom. Universal Design for Learning is a philosophical foundation for curriculum development that provides individual opportunities for learners. Universal Design for Learning also creates a way for all the learners through technology.

Rationale of the Study

The modern educational system is bound with challenges to accommodate heterogonous group of students. Due to various reasons, they are struggling to learn. Especially in primary stage students are diverse in nature. Each student has unique needs in the inclusive classroom. Some of them may need additional support to meet the expectations of the school system, while others crave for higher order learning skills, such as problem-

solving opportunities and autonomy. So, the Special Educational Needs Teachers may be able to accommodate and modify the existing learning system. This requires a lot of intervention and skills along with experience.

In order to engage the diverse learners, teachers have to prepare themselves to meet the diverse learning needs. Apart from this, adapted materials should pave way for overcoming the issues and challenges faced by the learners and take visual delight in accomplishing their learning objectives. Keeping all this in view, the researcher made an attempt to analyse the new concept in the field of education, which will be an emerging strategy in educating students with diverse needs. While analysing the review, investigator got insight to select the concept of Universal Design for Learning. UDL is an innovative educational approach to provide equal opportunities to the learners in the process of teaching and learning for their success. It is also flexible in nature and looks for different ways to keep the learners motivated. The present study attempts to evolve the Structured Modular Intervention with the simple technique of adopts existing system of Universal Design for Learning in teaching and learning. The existing models of UDL focused on one way intervention either auditory or visual form. It is evident from the literature review that the research in Universal Design for Learning is relatively new to Indian context and the Structured Modular Intervention is yet another area to be explored and the outcome has been proved scientifically.

Significance of the Study

- Universal Design for Learning skills of Special Educational Needs Teachers in inclusive education can be analysed.
- Universal Design for Learning based Structured Modular Intervention (SMI) Program for Special Educational Needs Teachers in inclusive schools can be developed to address the diverse learners and their learning needs.
- The Structured Modular Intervention will incorporate Universal Design for Learning principles with multisensory approach. This provides academic support to the students in the inclusive classroom especially students with Multiple disabilities can not only be benefited but also impactful.
- Special Educational Needs Teachers will be motivated and equipped to draw Universal Design for Learning based lessons in the light of technology.
- Efficacy of the Structured Modular Intervention (SMI) program can be accessed through Universal Design for Learning Self Scoring Test (UDL-SST) Tool.

Statement of the Problem

Kumar and Wideman (2014), highlights Universal Design for Learning can be possible with adequate intervention and immediate feedback. **"STRUCTURED MODULAR INTERVENTION FOR ENHANCING UNIVERSAL DESIGN FOR LEARNING SKILLS AMONG SPECIAL EDUCATIONAL NEEDS TEACHERS IN INCLUSIVE EDUCATION"**

Operational Definition

Structured Modular Intervention

Structured Modular Intervention is a multisensory approached program used in the present study prepared from National Council of Educational Research and Training (NCERT) class three textbook through pictural form, audio-visual form along with sign language incorporating Universal Design for Learning principles multiple means of engagement, expression and representation.

Universal Design for Learning

Universal Design for Learning is an educational framework for creating learning environments that address the diverse needs of learners. It provides students flexibility in the ways they access and engage with course materials and demonstrate mastery of learning objectives.

Special Educational Needs Teachers

Special Educational Needs Teachers are qualified with special teacher education qualification from recognized Teacher Training Institutes provide educational supports to the Special Educational Needs Student population. In India, they are registered with Rehabilitation Council of India (RCI) and having unique Central Rehabilitation Register (CRR) number.

Variables of the Study

Independent variables - Gender, generation, locality, type of school, level of special teacher education, disability specific specialization and number of CRE attended.

Dependent Variable - Understanding diversity, understanding needs of special educational needs students, understanding UDL principles multiple means of engagement, multiple means of representation, multiple means of expression, UDL and pedagogy.

Objectives

The major objectives of the study are to:

1) Analyse the existing Universal Design for Learning skills among Special Educational Needs Teachers in inclusive education.
2) Develop Universal Design for Learning based Structured Modular Intervention for Special Educational Needs Teachers.
3) Study the effectiveness of Structured Modular Intervention on Universal Design for Learning skills among Special Educational Needs Teachers.
4) Examine the efficacy of the Structured Modular Intervention in the acquisition of Universal Design for Learning skills among Special Educational Needs Teachers with respect to gender, generation, locality, type of school, level of special teacher education, disability specific specialization and number of CRE attended.

Hypothesis

The following Null-Hypothesis were tested in the present study

1. There is no significant difference in Special Educational Needs Teachers, Universal Design for Learning skills, before, after and follow-up phases.
2. There is no significant difference in Universal Design for Learning skills among Special Educational Needs Teachers before, after and follow-up phases on understanding diversity with respect to gender, generation, locality, type of school, level of special teacher education, disability specific specialization and number of CRE attended.
3. There is no significant difference in Universal Design for Learning skills among Special Educational Needs Teachers before, after and follow-up phases on

understanding needs of special educational needs students with respect to gender, generation, locality, type of school, level of special teacher education, disability specific specialization and number of CRE attended.

4. There is no significant difference in Universal Design for Learning skills among Special Educational Needs Teachers before, after and follow-up phases on understanding UDL principle multiple means of engagement with respect to gender, generation, locality, type of school, level of special teacher education, disability specific specialization and number of CRE attended.
5. There is no significant difference in Universal Design for Learning skills among Special Educational Needs Teachers before, after and follow-up phases on understanding UDL principle multiple means of representation with respect to gender, generation, locality, type of school, level of special teacher education, disability specific specialization and number of CRE attended.
6. There is no significant difference in Universal Design for Learning skills among Special Educational Needs Teachers before, after and follow-up phases on understanding UDL principle multiple means of expression with respect to gender, generation, locality, type of school, level of special teacher education, disability specific specialization and number of CRE attended.
7. There is no significant difference in Universal Design for Learning skills among Special Educational Needs Teachers before, after and follow-up phases on understanding UDL and pedagogy with respect to gender, generation, locality, type of school, level of special teacher education, disability specific specialization and number of CRE attended.

Scope of the Study

- ♣ The present research study aims to provide Structured Modular Intervention for enhancing Universal Design for Learning skills among Special Educational Needs Teachers in inclusive education to enrich their teaching skills.
- ♣ The Structured Modular Intervention will be helpful for the Special Educational Needs Teachers to address diverse learners and their needs in inclusive setup.
- ♣ The result of the study will be used to assess the efficacy of Universal Design for Learning skills among Special Educational Needs Teachers in Indian context.

Research Gap

Fowles (2015) says there is a lack of existing research on best practices for teachers to integrate UDL principles and addresses the needs of diverse learners in the classrooms, based on studies of *Spooner, Joshua N. Baker and Diane M. Browder* (2007). Inclusive School teachers were reported lack of effective, necessary intervention, guidance, and support to create attainable lessons that meet the needs of all students *Susan Courey, Phyllis Tappe, Jody Siker and Pamela Lepage* (2013). Teachers should be encouraged to participate in a variety of activities which will properly assist them to enhance their teaching skills *Essel et al.,* (2009). Educational approach is a process that correlates well with Universal Design for Learning where learner variability is considered in lesson plan through UDL guidelines. *Mc.Tighe, and Wiggins* (2012) suggests that educators' goals should guide the students to use knowledge meaningfully and promotes knowledge of understanding. Thus, the researcher has noticed difficulties to implement UDL principles in inclusive classroom from the existing models and prepared the Structured Modular Intervention program with multisensory approach to address the needs of diverse learners in the classroom.

Review of Literature

Literature review accomplishes several purposes. It shares with the reader the results of other studies that are closely related to the one being undertaken. It relates a study to the larger ongoing dialogue in literature, filling in gaps and extending prior studies. *Shields and Rangarajan* (2013) distinguish between the process of reviewing the literature and a finished work or product known as a literature review. The review describes, summarizes, evaluates and clarifies this literature. It gives a theoretical base for the research and help the author to determine the nature of the research. It provides a framework for comparing and establishing the importance of the study as well as a benchmark for comparing the results with other findings (*Creswell, 2009*).

The effects of intervention in Universal Design for Learning on lesson plan development of special and general educators in college was investigated. The results suggest that Universal Design for Learning helps the teachers to design accessible lesson plan for all students *Spooner et al* in 2007; Universal Design for Learning basic principles multiple means of representation, expression and engagement are made realistic through availability of

current educational technologies. The study delineates unique features of collaborative professional development opportunities and benefits for teachers and teacher educators *Zhang* and *Yixin* (2005); *Izzo, Murray, and Novak* (2008). *Cumming, Therese and Rose, Megan* (2021); Larger numbers of students are entering higher education with more diverse learning needs *Holly Buckland-Parker* (2012). *Parker, Robinson, and Hannafin* (2007) laid the foundation for UDL based interventions. *Kumar & Wideman* (2014) highlights Universal Design for Learning can be possible with adequate intervention and immediate feedback.

Rosa D. David and Carl E. Anderson (2022) work on Universal Design for Learning (UDL) for Language Learners gives an insight for the language development in early-childhood education. *Caroline Torres and Kavita Rao* (2019) Universal Design for Learning and the genre-based approach represents an opportunity to create a shift in language writing instruction that aligns with the principles of inclusive education by reducing barriers in the classroom and providing students with multiple pathways to participate, which could do much to advance knowledge about more inclusive, equitable and effective writing instruction for all learners

Alvyra Galkiene and Ona Monkeviciene (2021) mentioned, Universal Design for Learning model is the best practices in inclusive schools, it gives direction for the curricular activities. *Ning Yang, Jiuqian Shi, Jinjin Lu, and Yi Huang* (2021) revealed higher the teacher children communication higher the language and cognitive skills. Universal Design for Learning (UDL) has become a key pedagogical approach used in education systems which seek to promote inclusive and equitable education in response to student diversity. UDL helps the children in early language leaning, which results in receptive vocabulary competencies.

Methodology

The present research study aims to find out the efficacy of Structured Modular Intervention (SMI) Program in Acquisition of Universal Design for Learning skills among Special Educational Needs Teachers working in inclusive schools. Quasi-Experimental design was used for the study. The sample identified includes 100 male and 100 female Special Educational Needs (SEN) teachers with RCI-CRR number. Stratified random sampling method was used for the selecting the participants. 25 SEN teachers are form government schools of East part of the nation and 25 are from non-government schools. Bihar, Jharkhand, Odisha, West Bengal, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura are conceded as East region for the study. 50 West

region Special Educational Needs Teachers are from Goa, Gujarat, Maharashtra, Daman & Diu, Dadra and Nagar Haveli. 50 SEN teachers are from Delhi, Chandigarh, Ladakh, Jammu & Kashmir, Punjab, Rajasthan, Haryana and Himachal Pradesh are North region. 50 Special Educational Needs Teachers are from Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telungana, Puducherry and Andaman & Nicobar Islands are South region participants of the study.

Pretest was conducted for two months with 200 Special Educational Needs Teachers, after the pretest Structured Modular Intervention (SMI) program was administrated for three months. Post-test was conducted for two months after the intervention. Follow-up was carried out with two months interval for the 200 participants. In the inclusive ere all the teachers should have adequate knowledge about their diverse learning community. To meet the learning objectives of the students, teachers should be trained especially Special Educational Needs Teachers. To address the diverse learners and their educational needs the researcher has chosen UDL skills as the core area of the study. Thus, the Structured Modular Intervention (SMI) Program was prepared with NCERT class three text book through multisensory approach. Ninety percentage of the participants (180 SEN Teachers) are teaching class 3, so the researcher has chosen class 3 textbook for preparing Structured Modular Intervention program. Focused group discussion was carried with eminent professions in the field of Disability Rehabilitation and Inclusive Education for the conduct of the study. Cronbach's alpha test was performed for testing the internal consistency and the result is >0.9.

Teachers should be able to identify students disabilities including hidden disabilities. The teachers should also able to understand the diverse learners and their needs for the fruitful inclusion. This will enable the Special Educational Needs Teachers to address the needs of students and showcase their abilities. All the teachers are provided with equal periods (teaching time) in their schools, especially inclusive schools to execute the selected objectives through teaching and learning process. The main aim of the Structured Modular Intervention (SMI) program is to equip the Special Educational Needs Teachers to prepare UDL incorporated teaching and learning materials. Addressing all type of learners, one classroom in the given time is difficult for teachers. Thus, the Universal Design for Learning principles helps the teachers to meet the needs of diverse learners in the given time through multisensory approach.

The Structured Modular Intervention (SMI) Program is prepared based on the three UDL principles multiple means of engagement, expression and representation to address the issues faced by the teachers in the inclusive education system. Structured Modular Intervention program provides opportunity for teachers to express their ideas in multiple ways; pictural, visual, auditory form along with sign language through multisensory approach. Auditory learners and visually impaired students learn trough auditory form as well as in Braille form of the same information in the UDL enabled classroom. The hearing impaired and visual learners learn with the help of visual information and also with sign language. Students with ASD can learn through pictural form of the same information available in the same classroom. Students with Multiple Disabilities can learn through multisensory approach.

Research Tools

1). Personal Data Sheet

2). Universal Design for Learning-Self Scoring Test (UDL-SST) - Tool

Data Analysis Techniques

The following statistical techniques are used by the investigator for analysing the Special Educational Needs Teachers UDL-skills.

1. Mean & Standard Deviation
2. One-way ANOVA
3. Repeated Measures of ANOVA
4. Bonferroni Pair wise comparison
5. Scheffe Post-hoc Test

Major Findings

1. On understanding diversity, Special Educational Needs Teachers (N=200) before intervention the mean score is 21.12, after intervention it increased to 38.55 and in follow-up it is 43.32. It implies that, the Structured Modular Intervention programme was very effective among the SEN Teachers, UDL skills.

2. One-way ANOVA for Male and Female Special Educational Needs Teachers before intervention is not significant (F=0.07). After the Structured Modular Intervention the F score is 2.94, in follow-up phase the F score is 8.12 both are significant at 0.01 level. This significant difference among the SEN teachers UDL skills in after and follow-up phase shows both the male and female teachers UDL skills have increased.
3. Generation-X Special Educational Needs Teachers, before intervention mean score is 21.11 (N=34), whereas Generation-Z mean score is 20.80 (N=62), Millennials mean score is 20.83 (N=88), Boomers Generation mean score is 20.93 (N=16) and the total mean score of 200 SEN teachers is 20.88. After the intervention their total mean score is 37.84 (N=200) whereas the follow-up phase mean score is 42.13 (N=200). Thus, the Structured Modular Intervention programme prepared the Generation-X, Generation-Z, Millennials and Boomer generation SEN teachers to incorporate the UDL principle multiple means of engagement in the classroom.
4. On understanding UDL principle multiple means of engagement, Special Educational Needs Teachers (N=200) Repeated measures ANOVA score is 47938.98 and it is significant at 0.01 level. In the inclusive era SEN teachers must engage their students without any distraction to attain their learning goals. Thus, the significant difference among the SEN teachers expresses their increased confidence through UDL skills with the help of Structured Modular Intervention.
5. After the Structured Modular Intervention (SMI) Special Educational Needs Teachers secured significantly higher score in the post-test and follow up phases with respect to understanding UDL principle multiple means of engagement. After the intervention significant difference has been noted among the Rural and Urban SEN teachers UDL skills. This, significant difference shows the importance of the Universal Design for Learning principle multiple means of engagement among the Rural and Urban SEN teachers.
6. With regards to Government (N=100) and Non- Government School (N=100) Special Educational Needs Teachers scores for One way ANOVA score in before, after and follow-up phases are 0.11, 0.24, 0.03 and there is no significant difference in the three phases. This demonstrates both the Government and Non-Government School SEN teachers were equally trained in understanding UDL principle multiple means of expression.
7. While considering the qualification of Special Educational Needs Teachers Post-hoc test score is not significant in before, after and follow-up phases. This shows all the

four level qualified SEN teachers have same level of experience on understanding UDL principle multiple means of expression from the Structured Modular Intervention.

8. After the introduction of Structured Modular Intervention Special Educational Needs Teachers Repeated measures ANOVA score is significant at 0.01 level on understanding UDL and Pedagogy. This significant difference describes that all the SEN teachers (N=200) are effectively discussing the instructional goals with other teachers in their day-to-day academic activities as the result of Structured Modular Intervention programme.
9. Pertaining to disability specific specialization, mean score of the Special Education Needs Teachers after and follow-up phases were higher than the pretest scores. This increased mean scores, evident that all the four-disability specific specialization SEN teachers have increased UDL skills from the Structured Modular Intervention programme.
10. While considering the number of CRE attended, the Structured Modular Intervention has created same level of impact among the Special Education Needs Teachers.

Implications

1) Structured Modular Intervention will be helpful for the Special Educational Needs Teachers to implement the UDL principles multiple means of expression, engagement and representation in their classroom.
2) Special Educational Needs Teachers can be able to address the barriers in the inclusive classroom with digitalized materials as a result of the Structured Modular Intervention
3) Students with diverse needs will be benefited through the multisensory approach which is incorporated in the intervention.

Recommendations

- ♣ Universal Design for Learning based classes may be introduced to the students in pre-primary level and all the primary and pre-primary teachers may be oriented UDL-enabled classroom concept.

- ♣ Language teachers, subject teachers and Special Educational Needs Teachers should be able to identify the Special Educational Needs students in the inclusive education and periodically exchange ideas and materials related to their subjects.
- ♣ Technological skills of the Special Educational Needs Teachers may be upgraded. This will help them to deliver the lessons in UDL format using Multisensory method.
- ♣ Special Educational Needs Teachers may delivery their lessons in e-form. Thus, SEN teachers may be provided with multiple topics for assignments. So, the learners can choose the topics based on their interest.
- ♣ All the teacher training institutes may incorporate Universal Design for Learning skills in their syllabus for all level courses; Diploma, UG, PG and Research to prepare their students to address the diverse learners community.
- ♣ Universal Design for Learning enabled Cross Disability courses may be introduced extensively to bridge the different disability specific specialization teachers and enhance them to meet the needs of inclusive classroom.
- ♣ Students with benchmark disabilities and high support need group may be included in the Universal Design for Learning enabled classroom. Then only the concept of inclusion will come to real in the society.

Suggestions for Further Research

- The present study may be admitted with language teachers and subject teachers working in inclusive schools and Special Educational Needs Teachers working in special schools.
- The present study may be employed with Qualitative research through different variables to analyse their different dimensions.
- The present study may be replicated with high school and higher secondary text books.
- The same study may be administrated for particular place with state board syllabus.

Limitations

Limitations of the present study are mentioned below.

- Special Educational Needs Teachers working in special schools are not included in the present study
- Special Educational Needs Teachers with-out RCI registration are not a part of the study.
- Special Educational Needs Teachers who do not have minimum rehabilitation qualification (at-least Diploma) are not included in the study.

Conclusion

The Universal Design for Learning paves a way for inclusive learning environment by accommodating a wide variety of needs by eliminating the barriers for learning. Since we are marching towards inclusion, for effective inclusion the researcher developed the Structured Modular Intervention to train the Special Educational Needs Teachers on Universal Design for Learning Skills. Thus, it enables flexible classroom learning experience. In addition, to this Structured Modular Training, teachers can deliver meaningful and impactful learning opportunities to all the students in the inclusive classroom.

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